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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/644,523	08/18/2003	Chien-Wei Li	H0003938	5963

7590 02/28/2006

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EXAMINER
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MILLER, DANIEL H

ART UNIT	PAPER NUMBER
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1775

DATE MAILED: 02/28/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

<b>Office Action Summary</b>	Application No.	Applicant(s)	
	10/644,523	LI ET AL.	
	Examiner	Art Unit	
	Daniel Miller	1775	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 1-48 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-48 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. ____   |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>Aug. 10, 2005</u>   | 6) <input type="checkbox"/> Other: ____                                     |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-2, 7-12, 16-8, 20-24, 27-30, 33-40 are rejected under 35 U.S.C. 102(b) as being anticipated by Iyer et al (U.S. 6,121,133).

3. Iyer teaches forming an oxidation diffusion barrier stack on an integrated circuit (column 3 line 18-22). The oxidation diffusion layers comprise a various stacks of layers (see figures) of material dependent upon the embodiment. The stacks include an antireflective layer (isolation barrier) comprising silicon rich silicon oxide, nitride, or oxynitride while the diffusion barrier layers comprise silicon nitride (oxygen barrier) or silicon oxynitride (column 4 line 13-20). One embodiment teaches a pad oxide layer (SiO<sub>2</sub>) is formed on a silicon wafer (substrate the oxide layer is typically a few hundred angstroms thick (column 8 line 13-19). A first silicon nitride layer is deposited on the oxide pad (column 8 line 20-23). Then an arc layer (SiO<sub>2</sub>) is deposited on the silicon nitride layer (column 8 line 33-40). Then, as in figure 2D, a second silicon nitride layer is deposited (column 8 line 41-46) and then a photoresist layer (column 8 line 58-63).

4. Regarding claims 11-12, and 16 the thickness of the oxygen barrier coating is 1500 angstroms or less and the thickness of the isolation layer is 200-350 angstroms

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both of which comprise overlapping ranges with applicants claimed range (column 8 line 22-28, 35-40).

5. Regarding method claims 27-48, the silicon nitride layers (oxygen barrier) are deposited using Chemical vapor deposition (column 8 line 50-53).

6. Regarding claims that recite properties of the layers (such as claims 22, 29-30). It is the examiner's position that those properties are inherent to the identical materials that are both taught by the reference and claimed by applicant.

### ***Claim Rejections - 35 USC § 103***

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

8. Claims 3-6, 13-15, 19, 25-26, 31-32, 36, 42, 45-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iyers in view of Lucovsky (U.S. 6552403 B1) further in view of Barrow et al (U.S. 5,585,136).

9. Iyers discussed above is silent as to the presence of an environmental barrier coating.

10. Lucovsky teaches a binary oxide analogs of silicon dioxide (title). The layer is used as an insulating layer (see abstract). The layer comprises AlTiO<sub>2</sub> (claim 1 and 4).

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11. Barrow teaches a thermal barrier coating or dielectric coating (column 5-6 line 62-12) deposited using a sol gel method and comprising yttria stabilized zirconia (column 5 line 18-22; column 9 line 41-46).

12. It would have been obvious to a person of ordinary skill in the art to use the coating of Lucovsky as an environmental barrier coating because of its insulating properties and the coating of Barrow would help to provide both a thermal and dielectric barrier, which would enhance the ultimate purpose of the device.

13. Claims 2, 35, 37, 41, 43-44, 47-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over lyers.

14. lyers discussed above is silent as to the presence of specific additional layers.

15. However, however the reference envisions additional layers including any material known to prevent diffusion of oxygen in addition to or in place of stacks of layers dependent upon application (column 8 line 50-60).

16. Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention to add additional layers to optimize the diffusion barrier to a specific application.

### ***Conclusion***

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel Miller whose telephone number is (571) 272-1534. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Deborah Jones can be reached on (571) 272-1535. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Daniel Miller



**JENNIFER MCNEIL**  
**PRIMARY EXAMINER**  
2/20/06